

# **Quasi-biennial oscillation signatures in ozone and temperature observed by lidar at Mauna Loa, Hawaii (19.5°N, 155.6°W) .**

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## **Abstract**

The stratospheric Quasi-Biennial Oscillation (QBO) signatures (15-55 km) in ozone and temperature are presented using lidar ozone, and temperature measurements obtained between 1994 and 2000 by the Jet Propulsion Laboratory at Mauna Loa Observatory, Hawaii (19.5°N, 155.6°W). Despite the 1997-98 El Nino disrupting event, several clear QBO signatures have been observed in both ozone and temperature.

The QBO signature in stratospheric ozone maximizes near 31 km and is strongly seasonally synchronized in late winter-early spring and out-of-phase with the expected equatorial ozone QBO anomaly. Other (weaker) in- and out-of-phase signatures are observed in summer near 26 km, and in winter-spring near 47 km and near 22 km. The QBO signature in temperature maximizes at 35 km (5 K) and is also seasonally synchronized (winter) and out-of-phase with the expected signature at the equator. The QBO is also observable near 24 km and above 45 km, with opposite phase to that observed at 35 km.

These QBO anomalies identified in ozone and temperature are highly consistent with the previously observed and modeled QBO anomalies assuming that Hawaii is located in the subtropical branch of the asymmetrical QBO-induced meridional circulation.